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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,805	10/22/2003	Ian Robinson	NG(ST)-6758	6660
26294	7590	05/06/2004	EXAMINER	
TAROLLI, SUNDHEIM, COVELL & TUMMINO L.L.P. 526 SUPERIOR AVENUE, SUITE 1111 CLEVEVLAND, OH 44114			JEANGLAUDE, JEAN BRUNER	
			ART UNIT	PAPER NUMBER

2819

DATE MAILED: 05/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/691,805	ROBINSON, IAN	
	Examiner	Art Unit	
	Jean B Jeanglaude	2819	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 22 October 2003.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) 1-10 is/are allowed.

6) ☒ Claim(s) 11-20 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 22 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10-22-03.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Melanson (US Patent Number 6,346,898) in view of Ribner et al. (US patent Number 5,142,286).

3. Regarding claims 11 - 16, 18, 19, 20, Melanson discloses a system and method (fig. 4) for providing feedback within a delta-sigma analog-to-digital converter, comprising means for generating an N-bit digital feedback signal, where N is an integer greater than one (col 3, lines 29 – 31; col 4, lines 19 - 25; fig. 4); means (404, fig. 4) for quantizing the N-bit digital feedback signal to produce an M-bit signal, where M is a positive integer less than N (fig. 4) wherein the means for quantizing including means for producing a one-bit digital signal from the N-bit digital feedback signal (col 3, lines 25 – 27); means (104, fig. 4) for converting the quantized signal into an analog feedback signal (col 3, lines 29 – 31). Melanson does not disclose a system for providing feedback within a delta-sigma analog-to-digital converter that comprises a means for attenuating quantization noise associated with the means for quantizing within a frequency band of interest. However, Ribner et al. discloses a system (figs. 2 – 6) in which the quantization noise associated with the means for quantizing is attenuated

(paragraph bridging col 7 and 8) [as noted in Ribner et al. in paragraph bridging col 7 and 8, the decimation filter response a component arising from the accompanying wideband noise is attenuated respective to a component corresponding to a preamplifier analog output signal as well as the quantizing noise generated within the delta sigma delta modulator being As such the attenuation of the quantizing noise will occur with a desired frequency range]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Melanson's system with that of Ribner et al. in order to avoid undesirable noise aliasing when an integrating preamplifier is used.

4. Regarding claim 17, both Melanson and Ribner et al. does not explicitly disclose the system that further comprises means for altering at least one frequency characteristic of the means for generating. However, in attenuating the quantizing noise contribution to frequencies within frequency the band of interest an artisan in the art would recognize that within the frequency band of interest frequencies within the band of interest would be altered since the artisan in the art would have an alternative to select a desired frequency. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made that the combination of Melanson and Ribner et al would achieve the same end result at the claimed invention.

Allowable Subject matter

Claims 1 – 10 are allowable.

5. The following is a statement of reasons for the indication of allowable subject matter: in combination with other limitations of the claims the prior arts made of record

fail to suggest an analog to digital converter assembly that comprises a delta-sigma modulator that quantizes a digital output to produce a digital feedback signal as claimed in claim 1.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
7. Jackson (US patent Number 5,329,282) discloses a multi-bit sigma delta ADC with reduced sensitivity to DAC nonlinearities.
8. Wiesbauer (US Patent Number 5,959,562) discloses a sigma-delta modulator and method for operating such modulator.
9. Jensen et al. (US patent Number 6,362,762) discloses a multiple mode ADC employing a single quantizer.
10. Brooks (US patent Number 6,661,362) discloses methods and systems for high-speed quantizers.
11. Melanson (US Application Number 10/219,362) discloses a method and system of integrating a mismatch noise shaping into the main loop of a delta signal modulator.
12. Nelson (US patent Number 4,754,260) discloses a method of apparatus for reducing quantizing noise in ADCs.
13. Melanson (US patent Number 6,384,761) discloses a second and higher order dynamic element matching in multibit DAC and ADC data converters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean B Jeanglaude whose telephone number is 571-

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272-1804. The examiner can normally be reached on Monday - Friday 7:30 A. M. - 5:00 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Tokar can be reached on 571-272-1812. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jean Bruner Jeanglaude
April 15, 2004

**JEAN JEANGLAUE
PRIMARY EXAMINER**